CS5239 Computer System Performance Evaluation

2006/07 – Semester 2

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Performance

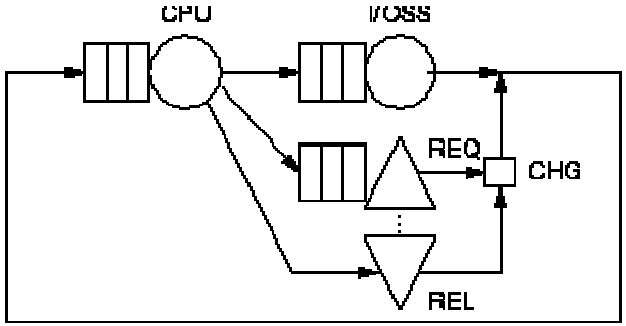
My Apple is faster than your Cray!

What is hard?

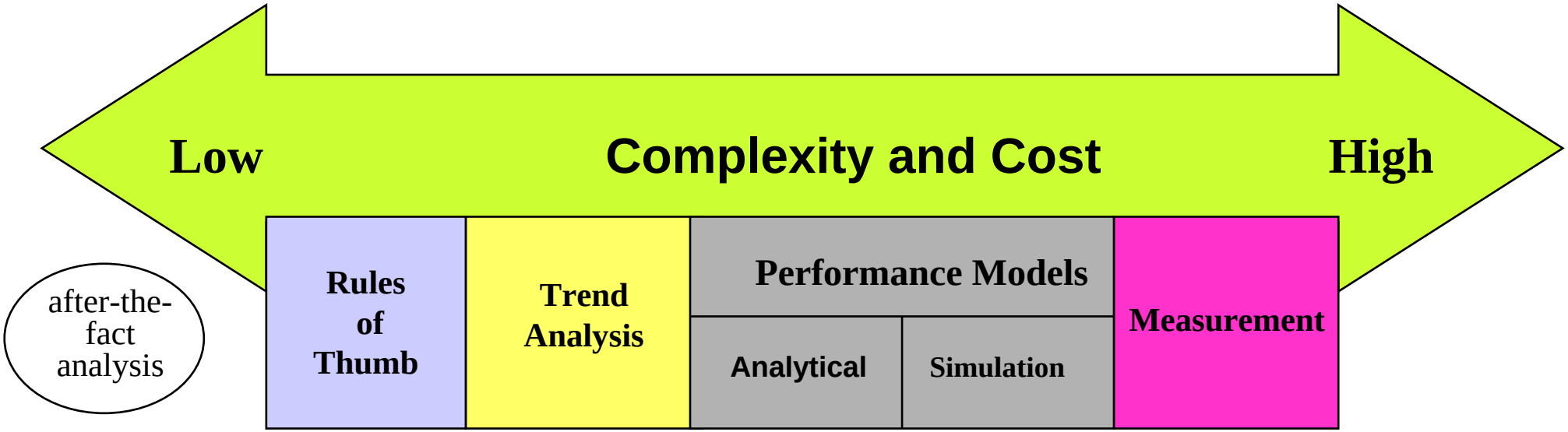
Performance of a computer system
is multidimensional.

Three Fundamental Techniques

- **Measurements** of actual systems
- **Simulations** using software models
- **Mathematical modeling** using such techniques as queuing analysis



Performance Evaluation



Course Schedule

Week	Date	Lecture	Others
1	12 Jan	L00 - Overview L01 - Introduction	· Course Description · Topics Detail (tentative)
2	19 Jan	L02 - Capacity Planning	
Measurement Techniques & Tools			
3	26 Jan	L03 - Selection, Characterization & Forecasting of Workload	Supplementary Slides L03S - Input Data Modeling
4	2 Feb	L04 – Instrumentation & Representation of Measurement Data	· conference leave, make up class ?
Simulation			
5	9 Feb	L05 – Basics of Computer Simulation	
Analytic Modeling Techniques			
6	16 Feb	L06 - Introduction to Queuing Theory	
17-25 Feb, Mid-Semester Break			
7	2 Mar	L07 - Operational Analysis	
8	9 Mar	L08 - Analysis of a Single Queue	
9	16 Mar	L09 - Analysis of Queuing Networks	Supplementary Slides L09S - Analysis of Queuing Networks (Multiple Job Classes)
10	23 Mar	L10 – Principles of Scalable Performance	
Case Studies			
11	30 Mar	L11 - Performance of Client-Server Architectures	· conference leave, make up class?
12	6 Apr	L12 – Web Performance Modeling	
13	13 Apr	Conclusion & Revision	· Table of Contents

Books

Main Textbooks

- The Art of Computer Systems Performance Analysis: Techniques for Experimental Design, Measurement, Simulation and Modeling, R. Jain, John-Wiley, 1991.
- Quantitative System Performance, E.D. Lazowska et al., Prentice-Hall, 1984, http://www.cs.washington.edu/homes/lazowska/qsp/.

Reference Books

- Capacity Planning and Performance Modeling - From Mainframes to Client-Server Systems, Daniel A. Menasce, et al., Prentice-Hall, 1994.
- Capacity Planning for Web Performance – Metrics, Models and Methods, D.A. Menasce, et al., Prentice-Hall, 1998.
- Simulation Modeling and Analysis, A.M. Law and W.D. Kelton, McGraw Hill, 3rd edition, 2000.
- Introduction to Parallel Computing, A. Grama, et al., Addison-Wesley, 2nd Edition, 2003.

Module Assessment

1. Continuous Assessment (60%)
   - Quiz (5%)
   - Assignment 1 (10%)
   - Assignment 2 (10%)
   - Project (15%)
   - Test (20%)

2. Open Book Exam (40%)
   - Reduced to 2 hrs

Everything should be made as simple as possible, but no simpler – attributed to Albert Einstein

Problems

- consultation hours – Friday, 9-11am, email, catch me after lectures ….